SARCOPHAGID FLIES FROM THE REVILLAGIGEDO ISLANDS

(DIPTERA: SARCOPHAGIDAE)

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The author is indebted to Dr. John N. Belkin, University of California, Los Angeles and to Dr. Edward L. Kessel, California Academy of Sciences, for making available for study small but important collections of Sarcophagid flies from the isolated and peculiar Islas Revillagigedo, Mexico, which lie in the Pacific Ocean, several hundred miles off the coast of Mexico. The largest Island, Socorro, is latitude 19° N., longitude 111° W., approximately 300 miles West by South of the tip of Baja California. San Benedicto, the smallest inhabited island, lies about 50 miles North of Socorro, and Clarion Island is about 250 miles West of Socorro and 480 miles S.W. of San Jose del Cabo, Baja California.

Six species are recognized in this material, of which three are new. The types of the new species have been returned to their respective institutions, designated as (UCLA) and (CAS). Paratypes, where available, are deposited in the United States National Museum (USNM), the American Museum of Natural History (AMNH), the Instituto Oswaldo Cruz (IOC) and the author's collection at Washington State University (WSU).

The nomenclature of the species is in accordance with the views of Dr. William L. Downes, Jr. (unpublished theses, Ames, Iowa; arrangement of Sarcophaginae at United States National Musuem, 1957; "Sarcophagidae" of the forthcoming Catalog of North American Diptera), with one exception: *Chrysostomomyia* is elevated to subgeneric rank.

KEY TO THE GENERA AND SPECIES

1. Posterior dorsocentral bristles 3, strong, evenly spaced 2
   Posterior dorsocentral bristles 4, or the anterior hairs of the row vestigial 4
2. Vein 1 setuled on basal half dorsally ..... **Helicobia marionella** (Ald.)
   Vein 1 bare 3
3. Propleuron pilose; median marginal pair of bristles on hind margin of 3rd apparent tergum ..... **Blaesoxipha (Acridiophaga) angustifrons** (Ald.)
   Propleuron bare; no median marginals on 3rd tergum ..... **Blaesoxipha (Kellymyia) californica** (Parker)
4. Dorsocentral bristles 2:4 ..... **Socorromyia blodgeti** new genus and species
   Dorsocentrals 0:1; only the prescutellar pair developed 5
5. Genital segments entirely black or dark brown; median marginal bristles present on 3rd tergum ..... **Peckia (Chrysostomomyia) nigricauda** new species
   Genital segments wholly or in part red; median marginals usually absent on 3rd apparent tergum ..... **Peckia (Chrysostomomyia) craigi** new species

NOTES AND DESCRIPTIONS OF THE SPECIES

Helicobia morionella (Aldrich)

Sarcophaga surrubea Aldrich, 1916:154, fig. 72 (not *surrubea* Wulp)
Sarcophaga morionella Aldrich, 1930:31.
Helicobia morionella, Lopes, 1939:508.

This is a widespread Neotropical species, ranging from California and Georgia to Puerto Rico and Brazil. It has also been recently collected in Hawaii, where it may have been accidentally introduced through commerce. One male, 3 females from Clarion and one male, Socorro Islands (UCLA, WSU).

Blaesoxipha (Acridiophaga) angustifrons (Aldrich)

Sarcophaga angustifrons Aldrich, 1916:142, fig. 63.
Sarcophaga caridei, Aldrich, 1927:588.
Servaisia (*Acridiophaga*) *angustifrons,* Roback, 1954:86, figs. 401-404.

This grasshopper parasite ranges widely in the United States and Canada, and was considered by Aldrich (1927) to be a synonym of *caridei* Brethès (Arg.); however, Roback (1954) restored it to specific rank. Four males, Clarion Island (UCLA, WSU), McDonald and Blodget collectors. These males agree very well with Aldrich's figure and description of *angustifrons,* except that the front is somewhat wider (0.11 to 0.13, average 0.12 of head width, compared with 0.084 to 0.12, average 0.098 for 6 males in the type series).

Blaesoxipha (Kellymyia) californica (Parker)

(Figs. 9-11)

Sarcophaga californica Parker, 1918:32.
Sarcophaga postilla Reinhard, 1947:111, fig. 17.
Kurtomyia postilla, Roback, 1954:84.

Male front 0.21 to 0.234 (average 0.224) of head width. A species very closely related to *cessator* Aldrich, with similar female genitalia. The female genitalia (figures 9-11) have broad genital sternites and the first genital tergum visible from above and lying in the same plane but inferior to the 4th apparent tergum. In these respects the female genitalia bear a resemblance to *Blaesoxipha plinthopyga* (Wd.) and *Socorromyia blodgeti,* new species.

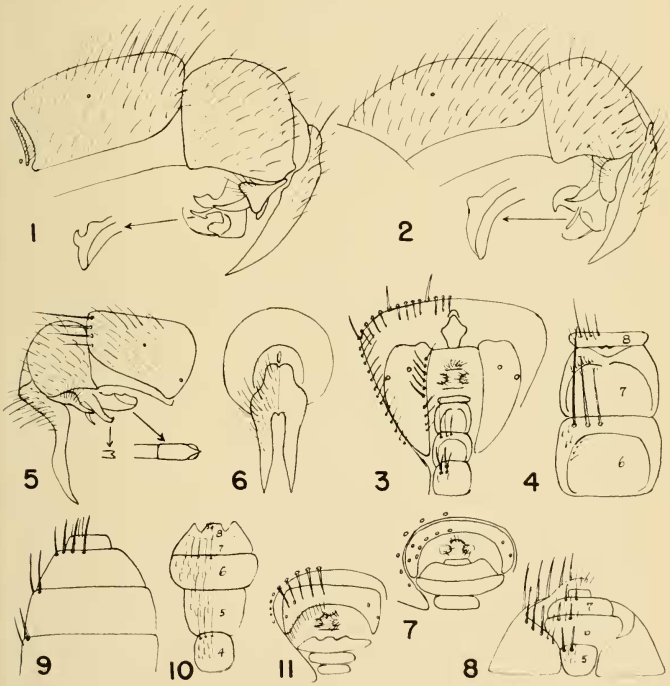
Female genital aperture posterior, transversely oval; genital segments red; 1st genital tergum whitish pollinose, not divided middorsally, visible from above, with marginal row of numerous (about 20) bristles; spiracle 6 on the tergum, near posterior margin; spiracle 7 at about middle of its length. Sternum 5 broader than 4; sternum 6 broadest, transverse; sternum 7 slightly narrower and shorter than 6; sternum 8 intimately fused with 7, trilobed on posterior margin, the middle lobe angular and setulose, the outer lobes triangular, glabrous, nude. Spermothecae 3, nearly globose, with 1 or 2 annuli.

Twelve males, 13 females, San Benedicto Island, April 30, 1955, McDonald and Blodget collectors (UCLA, WSU).

Socorromyia new genus

Male front narrow and without PFRO; outer vertical absent; arista long plumose on basal 0.60; acrostichals 0:0; dorocentrals 3:4; scutellum with 2 pairs of marginal bristles only; sternopleurals 2; prosternum and propleuron bare; mesosternum haired; postalar declivity with a few hairs.

This genus is based on *Socorromyia blodgeti* new species, known only from Socorro Island. The male genitalia, by conformation and particularly by the



Peckia (*Chrysostomomyia*) *nigricauda* new species. Fig. 1, profile of male genital composite with (arrow) enlarged ventral view of harpes. *Peckia* (*Chrysostomomyia*) *craigi* new species. Fig. 2, profile of genital composite, with (arrow) enlarged ventral view of harpes. Fig. 3, female genital orifice, posteroventral view. Fig. 4, female sternotheca (sterna 6-8). *Socorromyia blodgeti* new genus and species. Fig. 5, male genital composite, profile, with ventral view of penis and tip of anterior clasper. Fig. 6, forceps, posterior view. Fig. 7, tip of female abdomen, posterior view. Fig. 8, same, ventral view. *Blaesoxipha* (*Kellymyia*) *californica* (Parker). Fig. 9, tip of female abdomen, dorsal view. Fig. 10, sternotheca. Fig. 11, female genital orifice, posterior view.

small, unmodified penis, suggest an affinity with *Sarcophaga minutipenis* Hall but that species has the forceps vastly different. The female sternotheca is broad and the first genital tergum is undivided and visible from above.

The type species, S. blodgeti, n. sp.

Socorromyia blodgeti new species

(Figs. 5-8)

Length 7.5 to 10 mm. A medium sized species of the general *Sarcophaga* type but with distinctive male and female genitalia. Genital segments red; acrostichal, apical scutellar and median marginal bristles of 3rd tergum absent.

Male: Front at narrowest 0.155 to 0.180 (average 0.166 of four) of head width; outer vertical absent; inner vertical and reclinate frontoorbital bristles present; ocellar bristle moderately large; frontal rows of 9-10 pairs, widely divergent anteriorly; parafrontofacialia grey pollinose, with a row of small dark hairs. Antennae black, segment 3 3:1 and 2.5 as long as segment 2; arista long plumose on basal 0.60, dark, but with whitish band at middle of its length, basal 2 segments minute. Epistoma moderately warped forward; vibrissae slightly above oral margin; cheeks black-haired, metacephalon and occiput white-haired; 3 rows of black postocular bristles; palpi black, equal in length to haustellum, flattened basally, somewhat swollen apically.

Thorax black with grey pollen, forming the usual 3 black mesonotal stripes. Chaetotaxy: acrostichals 0:0; dorsocentrals 3:4; intraalars 1:1; supraalars 2:3; humerals 3; notopleurals 4; posterior callus 2; scutellars 2 marginal, 0 apical, 0 discal; sternopleurals 2; postalar declivity with few hairs; prosternum and propleuron bare; mesosternum haired; hind coxa setuled behind. *Legs* black, middle and hind tibia villous on apical half; mid femur without comb. *Wings* hyaline, slightly yellowed on basal half along costal margin; venation ordinary, vein 3 only setuled (basally); costal spine present, small; epaulet black; squamae white; halter dark brown, darker apically.

Abdomen rather slender, with usual grey checkering; lateral bristles only on segments 1-3; 4th segment with marginal row of 8 strong bristles; sterna 1-4 exposed, haired; sternum 5 deeply cleft, each arm with elongated finger-like posterior process; genital segment 1 black, pollinose apically, with marginal row of 8 bristles; genital segment 2 red, shining. Forceps long, acute, moderately separated, slightly angulated at middle of free portion, reddish basally becoming black apically, the tips acute; accessory plate brown, slender, subtriangular; claspers black, about equal length, posterior clasper straight, acute, and without bristle, anterior clasper moderately stout, with tip hooked and bifid; penis small, brown, 2-segmented, the apical segment quite simple. Male genitalia figures 5-6.

Female: Similar to male except for usual sexual differences (front about 0.33 of head width, with 2 strong PFRO; outer vertical present; legs without ventral villosity on tibiae; fore and middle femora with huge red modified areas posteriorly). Tergum 4 with marginal row of about 14 strong, erect bristles interspersed with a few smaller, recumbent bristles; sterna 3-5 completely concealed by the overlapping margins of the terga; sterna 2-5 with posterior marginal bristles; sterna 6-8 (sternotheca) fused, broadened, red, 6 larger than 7 plus 8; genital aperture posterior, rounded, genital tergum 1 visible from above, not divided dorsally, with marginal row of 12 very stout bristles, spiracles 6 and 7 both on the tergum; sternum 8 small, rectangular, intimately fused with 7; spermothecae 3, oval, with few annuli. Genital segments figures 7-8.

Holotype male and *allotype* female: Socorro Island, May 1-5, 1955, McDonald and Blodget (UCLA). *Paratypes:* 3 males, 5 females, same data as holotype (UCLA, IOC, WSU); 1 female, Socorro Island, T. Craig (CAS).

This species is dedicated to Mr. D. Claude Blodget, one of its collectors. It is identical with *Prosthetocirca cana* (Tns.) from the Galapagos Islands in one interesting feature—females of both species have terga 2-4 overlapping and completely concealing sterna 3-5, whereas in the male these sterna are completely exposed. *P. cana* females lack the modified fore femur as described for *blodgeti*, and the two genera are not otherwise closely related, though both are endemic to restricted Pacific islands.

Peckia (Robineau-Desvoidy)

Peckia (*sensu* Downes manuscript) is a large, diverse group of Neotropical species, whose members are divisible into at least 9 described and a number of undescribed subgenera. *Peckia* (*sensu stricto*) consists of *Musca praeceps* Fab. and allied species with abdomen shining black, non pollinose; squamae black. With *praeceps* Downes combines *Chrysostomomyia* and other species as subgenus *Peckia*.

Chrysostomomyia Townsend, as a subgenus of *Peckia*, is a compact group of species with very similar male genitalia. It would seem advantageous to recognize this species group as a subgenus, rather than to obscure relationships by lumping it with *Peckia* (*s.s.*) and *Paraphrissopoda* as subgenus *Peckia*. Two new species of this group are represented in the material from the Revillagigedos Islands. Both are very similar to the type species, *Sarcophaga chrysostoma* Wied., but differ obviously in the coloration of the male genitalia, and both possess only one (not 2) dorsocentral bristle. Further differences between them and the continental species are equally obvious: the head is grey or yellowish grey pollinose (not bright yellow), the sternopleural bristles are usually 2 (not 3), and the "harpes" of the male penis bears a lobe or tooth on the outer margin.

Peckia (Chrysostomomyia) nigricauda new species

(Figure 1)

Length: 12-19 mm:; a large, black-tailed species with discal thoracic bristles wanting and male middle and hind tibiae densely villous.

Male: Front at narrowest (slightly before ocelli) 0.200 to 0.231 (average 0.218 of six) of head width; outer vertical and ocellar bristles vestigial; PFRO absent; frontal rows of about 10 pairs, moderately divergent anteriorly; parafaciofrontalia yellowish grey pollinose, with a row of small black hairs becoming about 3 rows towards the vertex; cheeks, metacephalon and occiput yellowish grey pollinose, with whitish hairs except for 2 postocular rows of black hairs, continued as a few dark hairs below the eye. Vibrissae distinctly above the oral margin, with the usual adjacent black bristles continued as a row along the buccal margin and along nearly half the length of the facial ridge. Antenna 3 about 4:1, black, reddish brown basally; arista long plumose 0.75 from base, the

second segment nearly as long as its diameter. Palpi black, slender, as long as haustellum.

Thorax greyish pollinose, with the usual 3 black stripes; chaetotaxy: acrostichals 0:0; dorsocentrals 0:1; intraalars 0:1; supraalars 1:3; scutellars 2 marginal, 1 apical (large, cruciate), 0 discal; humerals 2; notopleurals 4; posterior callus 2; postalar declivity setuled; propleuron bare; prosternum setuled; sternopleuron with 2 (rarely a small 3rd) bristles near dorsal border and extremely densely bristled ventrally; hind coxae setuled behind. *Legs* black, middle and hind tibiae densely villous, fore tibia slightly so; all femora villous ventrally and coxae densely bristled apically; hind femur slightly bowed, anterodorsally with a row of about 12 bristles; middle femur without comb. *Wings* hyaline, costal spine absent; vein 3 setuled at base, others bare; epaulet black; squamae white, with a large discal brownish cloud on the lower lobe.

Abdomen black, grey pollinose in the usual checkered pattern; terga 1-2 with a lateral bristle only; tergum 3 with 2 lateral and a median marginal pair; tergum 4 with marginal row of numerous bristles; sterna 1-4 without bristles but uniformly clad with hairs which become shortest on sternum 4; sternum 5 large, V-shaped, each arm thickened and densely clad with short bristles near base, thin and sparsely haired along the sides, and with some longer hairs apically. Genital segments black or dark brown, shining, the first 1.5 longer than wide, with a triangular pollinose patch posterodorsally and uniformly haired, the hairs somewhat longer posteriorly but without a marginal row of bristles. Forceps black, slightly curved and tapering to a point in profile, the apical portions well separated in posterior view and setuled, becoming bare apically; accessory plate triangular, thickly clad with long bristly hairs except at the apex, which is bare, thin and incurved; claspers black, the posterior pair shorter, anterior pair rather simple, tapering to a curved point apically; penis very similar to *chrysostoma*, with a pair of long, *smooth*, slender filaments from near apex, which is bluntly produced; harpes of ventralia with an acute recurved hook at the middle of its outer margin (fig. 1, arrow). A similar, simple triangular process is also present in the following species, thus distinguishing both species from *chrysostoma*, which has none. Genitalia figure 1.

Female: Unknown.

Holotype male (UCLA) and 2 *paratypes* (IOC, WSU): Clarion Island, May 7-8, 1955, McDonald and Blodget; 2 paratypes, Clarion Island, T. Craig coll., Feb. 27, 1928 (CAS) and March 22, 1932 (WSU).

Peckia (Chrysostomomyia) craigi new species

(Figures 2, 3, 4)

Length 9-18 mm., genital segments partly red (male) or entirely red (female); frontal vitta broadening to lunule.

Male: Front at narrowest 0.17 to 0.210 (average 0.182 of seven) of head width; ocellar and outer vertical bristles vestigial; frontal vitta velvety black, narrowest at RFRO and broadening to lunule; frontal rows of about 11 pair, hair-like above, moderately divergent below; parafaciofrontalia brownish yellow pollinose, with 3 rows of black setules above, becoming 1 row below; parafacials broad, 0.80 of width of facial plate; vibrissae well above oral margin, index (distance above/distance between) 0.40 or greater; cheeks broad, 0.375 of head

height, greyish pollinose, white haired; occiput grey, white-haired, with 1-2 rows of black postocular bristles. Antennae black, segment 3 4:1; arista long plumose on basal 0.70. Palpi slender, blackish; haustellum black, as long as antennae.

Thorax greyish pollinose (*brownish* grey in some individuals), with 3 black stripes. Chaetotaxy: acrostichals 0:0 (or prescutellar extremely weak); dorsocentrals 0:1; intraalars 0:1; supraalars 1:3; humerals 2; notopleurals 4; posterior callus 2; postalar declivity setuled; scutellars 2 marginal, 1 apical (strong), 0 discal; sternopleurals 2 (a weak 3rd sometimes in line with the others); prosternum setuled; propleuron bare; hind coxae setuled behind. *Legs* black; hind and mid tibiae villous (extremely so in large individuals); hind femur slightly bowed; mid femur without comb. *Wings* hyaline, veins brown, vein 3 setuled at base above and below; epaulet black; basicosta white; squamae whitish, lower lobe with a cloud or in large part translucent.

Abdomen black, grey or brownish grey pollinose with usual checkered pattern; terga 1-3 with lateral bristles only; sterna 1-4 strongly narrowing, black-haired, overlapping the terga, without bristles; sternum 5 broadly V-shaped, with brushes of black spines at the base of each arm. Genital segment 1 blackish, shining, with triangular yellowish pollinose patch posteriorly, without marginal row of bristles but with larger, erect hairs on the pollinose patch; genital segment 2 red, setose, slightly pollinose on back, glabrous on sides. Forceps elongate, slightly bowed in lateral view, somewhat inflated in the smallest males, more slender in the large males; penis and claspers much like *nigricauda* but the penis with larger ventralia, apex more rectangular and "harpes" with an isosceles triangular projection on its outer margin.

Female: Much as the male, but front broad, 0.28 of head width, with 2 PFRO; outer vertical 0.67 of inner; frontal vitta broadening to lunule as in male. Tibiae non-villous; coxae and venter of thorax not so densely bristled; abdomen broad; sterna 2-6 with strong bristles (very stout on 3-5) on posterior margin, sternum 6 with 3 pair, the inner pair smallest, sterna 3-6 overlapped by the margins of the terga, 3-8 of uniform width. Genital orifice (fig. 3) large, subtriangular, entirely concealed from above, the dorsal margin slightly rounded and with numerous bristles, of which only 3 pair are erect; genital segments fully exposed, yellowish red; genital tergite divided into two rather pentagonal, flat lateral pieces, their inner margins parallel, each with a marginal row of about 10 bristles, of which 5-6 are stout; spiracle 6 at margin, 7 at middle of width of the tergum; a middorsal pentagonal sclerotization in the dorsal membrane connecting the two halves of the tergum. Sternotheca (fig. 4) not broader than the preceding sterna; sterna 6-7 subrounded, with concave, glabrous disc, 6 bristled, 7 not so, 8 short and tranverse. Spermatheeae 3, small, globular, with smooth walls.

Holotype male and *allotype* female (CAS): Socorro Island, Mexico, March 1, 1928, T. Craig. *Paratypes:* 3 males, 4 females, same data as holotype (CAS, AMNH, WSU); 22 males, 8 females, Socorro Island, May 1-5, 1955, McDonald and Blodget (UCLA, AMNH, USNM, IOC, WSU).

Variations in chactotaxy and male forceps: This species varies quite clearly from one to two complete rows of black postocular hairs. The sterno-pleurals are often 3 in a straight line, the middle one weak, but in two small females and many males it is entirely lacking and one male has but a single sternopleural on one side. Median marginal

bristles of third tergum are lacking in all males and all but two females of the (UCLA) series. The villosity of the male mid and hind tibiae is usually dense and long, but the smallest male has sparse villosity only slightly longer than the diameter of the tibia. This male also has the forceps perceptibly inflated, as compared with the other specimens.

This species is dedicated to Mr. T. Craig, who first collected it. It is known only from Socorro Island. A further distinction between it and *nigricauda* is of special interest—the frontal vitta is broadened to the lunule in *craigi* but sub parallel its entire length in *nigricauda*.

It would be interesting to learn if either of these two *Chrysostomomyias* occur on San Benedicto Island, or if perhaps a third endemic species remains to be discovered.

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A TRIBE OF CECIDOMYIIDAE (DIPTERA) NEW TO NORTH AMERICA

A single male specimen, received for identification from J. P. Hungate, collected at Ogotoruk Creek, Cape Thompson, Alaska (lat. 68° N., long. 166° W.), August 29, 1960 (J. J. Davis), agrees so well with Edwards' redescription of the type that I must consider it the following species.

Family Cecidomyiidae, Subfamily Lestremiinae, Tribe Strobliellini, *Strobliella intermedia* Kieffer 1898, Bull. Soc. Hist. Nat. Metz (2) 8: 51; Edwards 1938, Proc. Roy. Ent. Soc. London (B) 7(5): 107; Pritchard 1951, Univ. Calif. Publ. Ent. 8(6): 239.

The type was from Austria, and Edwards recorded a specimen each from Scotland and England. The species is the only representative of its tribe.

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